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Submission to the Federal Communications Commission  
Docket ET 13-84  
Reassessment of Federal Communications Commission RF Exposure Limits and Policies

I am submitting for your consideration a newly published paper by T. Koppel, M. Ahonen, M. Carlberg, L. Hardell published in Environmental Research, "Very high radiofrequency radiation at Skeppsbron in Stockholm, Sweden from mobile phone base station antennas positioned close to pedestrians' heads" by Elsevier, Inc. available online 4 January 2022.

In the urban environment there is a constant increase of public exposure to RF-EMF from mobile phone base stations. With the placement of mobile phone base station antennas radiofrequency hotspots emerge. This study investigates an area at Skeppsbron Street in Stockholm, Sweden with an aggregation of base station antennas placed at low level close to pedestrians' heads. Detailed spatial distribution measurements were performed with: 1) a radiofrequency broadband and 2) a portable exposimeter. The results display a greatly uneven distribution of the radiofrequency field with hotspots.

The position of these antennas can pose a health risk to people at close range. This is especially critical for people at particular risk, including persons with medical implants, pregnant women or chronically ill persons. Based on the latest scientific literature regarding RF exposure and adverse health effects, this study recommends repositioning such base station antennas to areas away from the nearby inhabitants, workers and the general public. Alternatively, very low power antennas may also be considered to reduce exposure. Occupational exposure of people working close to the antennas should also be considered – shop clerks, restaurant workers are likely to spend considerably longer time under high exposure, compared to the general public. The following recommendations for RF infrastructure can be concluded from the current study.

1. Antennas should be positioned as far as possible from the general public, like locations at the high elevations or remote areas, where the antenna targeted area is not regularly/frequently visited by the members of the public.
2. Only low power output mobile phone base station antennas (<15W) should be used in the city environment.
3. To avoid hotspots, created by overlapping arrays, dense packing of antennas at one site to be avoided.
4. Low power output antennas in the city environment should be positioned into locations where direct beam would not hit members of public closer than 50m. The conclusions of this study will help to design safer mobile phone base station sites in the city environment when the aim is to minimize public exposure.

Respectfully submitted,



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